

NASA TECH BRIEF

Lewis Research Center

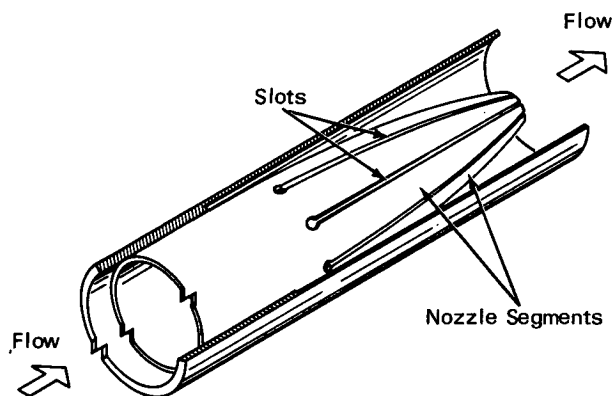


NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

Variable-Area Nozzle Automatically Controls Fluid Flow

The problem:

In fluid injection systems with fixed-area orifices or nozzles, the pressure drop varies as the square of the flow rate. When large variations in flow



rate are required, it is often necessary to provide excessive pressure at the pump or other pressurized fluid supply.

The solution:

A simple passive nozzle requires no active control system to vary the injection area. The injection area changes with changing pressure, thereby allowing greater flow as the pressure increases.

How it's done:

A slotted nozzle with expandable segments or leaves is used as the injection flow-control orifice of the system. As the pressure difference across the nozzle is increased, the segments of the nozzle expand outward, increasing the slotted injection or flow area. Flow is thereby increased more rapidly than with an orifice of fixed area, and the pressure requirements for a given flow range are reduced. As the pressure drop across the nozzle is decreased, the spring action of the segments causes them to move inward, decreasing the flow area.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
Reference: B71-10222

Patent status:

No patent action is contemplated by NASA.

Source: E. W. Conrad
Lewis Research Center
(LEW-11217)

Category 07